

POSTER PRESENTATION

Open Access

0548. Effects of sedation and muscle paralysis on inflammation during mechanical ventilation

LG Ayala¹, M Abreu^{1*}, M Avila², BC Bergamini¹, AC Neto¹, WA Zin², A Giannella Neto¹, AR Carvalho^{1,2}

From ESICM LIVES 2014

Barcelona, Spain. 27 September - 1 October 2014

Introduction

A significant reduction in mortality was observed in severe ARDS patients when neuromuscular blockage (NMB) was used in the acute phase (Papazian L. et al, 2010).

Objectives

We aim to evaluate pro- and anti-inflammatory markers immediately after two hours ventilation in lung-injured rats with different sedation protocols.

Methods

Thirty male Wistar rats were divided into five groups (6 animals each): low sedation, high sedation (with or without NMB) and a healthy, non-ventilated control group. Animals were anesthetized with 2.8 or 1.4%vol isoflurane and 2.5 or 0.5 mg/kg midazolam in high and low sedation groups, respectively; and 10 mg/kg +10 mg/kg/h atracurium in NMB group. After intubation and stabilization period (baseline settings: VT= 8 mL/kg, FR=70 rpm, FiO₂=50%, PEEP=3, I:E = 1:2), lung injury was induced by intratracheal injection of LPS (15 mg/kg) + ventilation induced lung injury (2.5xVT, FR=32, PEEP=10 cmH₂O for 45s) (Dixon et al, 2009). Thereafter animals were ventilated for 2 hours with baseline settings. Airway (Paw), esophageic (Peso) were continuously recorded (200 Hz sampling frequency). The mean power of Peso was then calculated, by means of the spectral density estimation (Welch's periodograms, 400 samples window, 50% overlap). At the end of ventilation, mean arterial pressure (MAP) and gas analysis were evaluated in all ventilated groups. Lungs were extracted for cytokines (IL-6, IL-10) measurement. Euthanasia was performed by exsanguination associated to isoflurane overdose. Data were

compared with Shapiro-Wilk, ANOVA and Bonferroni post-hoc tests, $p \leq 0.05$.

Results

No differences in mean MAP and heart rate were observed. PaO₂/FiO₂ and PCO₂ were higher in non-paralyzed groups compared to paralyzed groups ($p=0.01$). Peak and mean Paw were significantly lower ($p \leq 0.01$) whereas the mean power of Peso was higher ($p=0.004$) in the low sedation without NMB. IL-6 concentration was also significantly lower in this group ($p < 0.001$) and presented a negative correlation ($r = -0.59$, $R^2=0.34$ and $p=0.002$) with Mean power of Peso. Furthermore, IL-10 concentration was higher in the low sedation without NMB compared to the others ($p=0.002$) and also correlates with the mean power of Peso ($r = 0.60$, $R^2=0.36$ and $P=0.002$).

Conclusions

Animals with a superficial sedation scheme in absence NMB might have more recruited lungs (lower Ppeak and Pmean), less inflammation and higher anti-inflammatory markers. The long-term consequences must be further evaluated.

Grant acknowledgment

This work was supported by CAPES, CNPq and FAPERJ.

Authors' details

¹Federal University of Rio de Janeiro, Laboratory of Pulmonary Engineering, Rio de Janeiro, Brazil. ²Federal University of Rio de Janeiro, Carlos Chagas Filho Institute of Biophysics, Rio de Janeiro, Brazil.

Published: 26 September 2014

References

1. Papazian L, Forel J-M, Gacouin A, et al: **Neuromuscular blockers in early acute respiratory distress syndrome.** *N Engl J Med* 2010, **363**:1107-16.

¹Federal University of Rio de Janeiro, Laboratory of Pulmonary Engineering, Rio de Janeiro, Brazil

Full list of author information is available at the end of the article

2. Dixon D, De Smet H, Berstena AD: **Lung mechanics are both dose and tidal volume dependant in LPS-induced lung injury.** *Resp Physiol Neurobiol* 2009, **167**:333-340.

doi:10.1186/2197-425X-2-S1-P32

Cite this article as: Ayala et al.: 0548. Effects of sedation and muscle paralysis on inflammation during mechanical ventilation. *Intensive Care Medicine Experimental* 2014 **2**(Suppl 1):P32.

Submit your manuscript to a SpringerOpen[®] journal and benefit from:

- Convenient online submission
- Rigorous peer review
- Immediate publication on acceptance
- Open access: articles freely available online
- High visibility within the field
- Retaining the copyright to your article

Submit your next manuscript at ► springeropen.com
